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EXAMINER

HUYNH, THU V

ART UNIT

PAPER NUMBER

2178

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/283,561

Applicant(s)

CHALLENGER ET AL.

Examiner

Thu V Huynh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6-29 and 32-74 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-29 and 32-74 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This action is responsive to communications: Request for CPA filed on 01/06/2003 to application filed on 04/01/1999.
2. Claims 23 and 49 are amended.
3. Claims 61-74 are added.
4. Claims 1-3, 6-29, and 32-74 are pending in the case. Claims 1, 16, 27, 42, 53, and 61 are independent claims.
5. The rejections of claims 23 and 49 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention have been withdrawn in view of the amendment.
6. The rejections of claims 1-3, 6-8, 11, 14-15, 27-29, 32-34, 37, 40-41, and 53-56 under 35 U.S.C. 103(a) as being unpatentable over Challenger et al., US 6,026,413 filed 08/1997 in view of Cormen et al., "Introduction to Algorithms", copyright 1990, pages 477-493. have been withdrawn as necessitated by the amendment.
7. The rejections of claims 9-10 and 35-36 under 35 U.S.C. 103(a) as being unpatentable over Challenger in view of Cormen as applied to claim 7 above, and further in view of Unger et al., US 6,230,168 B1 filed 11/1997 have been withdrawn as necessitated by the amendment.
8. The rejections of claims 12-13, 38-39, and 57-60 under 35 U.S.C. 103(a) as being unpatentable over Challenger in view of Cormen as applied to claims 11 and 53 above, and further in view of Sequeira, US 6,185,585 B1 filed 12/1997 have been withdrawn as necessitated by the amendment.

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9. The rejections of claims 16-17, 20-22, 42-43, and 46-48 under 35 U.S.C. 103(a) as being unpatentable over Challenger et al., US 6,026,413 filed 08/1997, in view of Unger et al., US 6,230,168 B1 filed 11/1997 have been withdrawn as necessitated by the amendment.
10. The rejections of claims 16-17, 20-22, 42-43, and 46-48 under 35 U.S.C. 103(a) as being unpatentable over Challenger et al., US 6,026,413 filed 08/1997, in view of Unger et al., US 6,230,168 B1 filed 11/1997 have been withdrawn as necessitated by the amendment.
11. The rejections of claims 18-19 and 44-45 under 35 U.S.C. 103(a) as being unpatentable by Challenger in view of Unger as applied to claim 16 above, and further in view of Sequeira, US 6,185,585 B1 filed 12/1997 have been withdrawn as necessitated by the amendment.
12. The rejections of claims 23-26 and 49-52 under 35 U.S.C. 103(a) as being unpatentable over Challenger in view of Unger as applied to claim 20 above, and further in view of Cormen et al., "Introduction to Algorithms", copyright 1990, pages 477-493 have been withdrawn as necessitated by the amendment.

Specification

13. The disclosure is objected to because of the following informalities:

Regarding specification page 18, lines 19-20, Attorney docket number should be replaced with "U.S. Patent Application Number 09/283,562 – currently pending".

Regarding specification page 19, lines 3-4, Attorney docket number should be replaced with "U.S. Patent Application Number 09/283,542 – currently pending".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

(b) This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. **Claims 1-3, 6-8, 11-15, 27-29, 32-34, 37-41, 53-67, and 70-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al., US 6,336,123 B2 filed 10/1997 in view of Broder et al., US 6,073,135 filed 03/1998, and Cormen et al., "Introduction to Algorithms", copyright 1990, pages 477-493.**

Regarding independent claim 1, Inoue teaches the steps of:

- providing a plurality of objects, at least one of the objects including a relationship with another object in the plurality of objects (Inoue, col.12, lines 33-38, providing many hypertext documents/web pages (objects or nodes), which have relationships between web pages);
- identifying at least one relationship between the plurality of objects (Inoue, col.12, lines 33-38, indicating relationships between web pages);

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- representing the at least one relationship between the plurality of objects using at least one graph (Inoue, col.12, lines 33-50; and fig.13, representing relationships between many web pages using hierarchy structure); and
- traversing at least one graph to construct objects accordance with at least one relationship and update to at least one of the objects in plurality of the objects (Inoue, col.17, lines 55-62; col.18, line 61 – col.19, line 24, teaches the use of connection relationships between web pages (nodes, objects) to construct and update web pages information according to changes).

Inoue does not explicitly disclose topologically sorting the at least one graph to determine the order in which to construct objects in accordance with the at least one relationship and an update to at least one of the objects in plurality of objects. However, Inoue teaches generating web pages “not to confuse a reader of an HTML document” (Inoue, col.3, lines 18-23). Inoue specifically teaches the content of each web page is managed in dependence of the hierarchy structure (Inoue, abstract) and changing content of a web page causing a change of other web page(s) according to connection relationship(s) between the web pages (Inoue, col.17, lines 55-62; col.18, line 61 – col.19, line 24).

Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately and consistently linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Broder and Inoue to traversing the graph to update web

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pages and links of a web site, since it would have help the web site to provide accurate and consistent information for the user, prevent inaccessible to web page(s) which have been deleted or added.

Cormen mentions an example in how topology sort is used in ordering (page 485, lines 1-8 from bottom).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined a well known traversal method such as topology sort with Inoue and Broder's system to guarantee a consistency in orderly updating objects in the topology graph, since the orderly updating of objects is important in maintaining the set of pages (objects) on a web site.

Regarding dependent claim 2, which is dependent on claim 1, Inoue, Broder, and Cormen teach the limitations of claim 1 as explained above. Refer to the rationale relied to reject claim 1. The limitation of "wherein the step of representing the at least one relationship between the plurality of objects includes the step of representing objects in the plurality of objects by nodes and representing at least one relationship by at least one connection between nodes" is addressed. The rationale is incorporated herein.

Regarding dependent claim 3, which is dependent on claim 1, Inoue, Broder, and Cormen teach the limitations of claim 1 as explained above. Refer to the rationale relied to reject claim 1, the combination of Inoue, Broder, and Cormen teaches the order of traversal is built according to the objects dependencies of objects in hierarchy structure. This includes the

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limitations of “selecting sort criteria based on one of performance and correct construction of the plurality of objects”. The rationale is incorporated herein.

Regarding dependent claim 6, which is dependent on claim 1, Inoue, Broder, and Corman teach the limitations of claim 1 as explained above. Refer to the rationale relied to reject claim 1, the limitation of “constructing objects based on the order” is included. The rationale is incorporated herein.

Regarding dependent claim 7, which is dependent on claim 1, Inoue, Broder, and Corman teach the limitations of claim 1 as explained above. Inoue does not explicitly teach publishing at least one of the plurality of objects. However, Inoue teaches “generating HTML documents used for all purpose ... not to confuse a reader of an HTML document” (Inoue, col.3, lines 18-23) which suggests HTML documents (objects) are published for readers. Besides, Broder teaches a web site maintains web pages for users access (Broder, col.3, lines 15-23).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Broder and Inoue to publish web pages for the users after prepared as Inoue suggested.

Regarding dependent claim 8, which is dependent on claim 7, Inoue, Broder, and Corman teach the limitations of claim 7 as explained above. The limitation of “wherein all of the at least one of the plurality of objects are published together” is addressed under the same rationale as provide above in the rejection of claim 7.

Regarding dependent claim 11, which is dependent on claim 7, Inoue, Broder, and Cormen teach the limitations of claim 7 as explained above. Inoue does not explicitly teach wherein the step of publishing includes the step of satisfying at least one consistency constraint.

However, Inoue teaches generating web pages “not to confuse a reader of an HTML document” (Inoue, col.3, lines 18-23). Inoue specifically teaches the content of each web page is managed in dependence of the hierarchy structure (Inoue, abstract) and changing content of a web page causing a change of other web page(s) according to connection relationship(s) between web pages (Inoue, col.17, lines 55-62; col.18, line 61 – col.19, line 24).

Broder teaches a web site maintains “accurate linkage information ... updating connectivity information so that linkage information is current” for users access web pages in the web site (Broder, col.1, lines 61-67).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Inoue and Broder to provide web page(s) that satisfying at least one consistency constraint for the user, since information or/and links within the web page are updated to current information will not confuse the reader.

Regarding dependent claim 12, which is dependent on claim 11, Inoue and Cormen teach the limitations of claim 11 as explained above. Inoue does not explicitly disclose wherein the step of satisfying at least one consistency constraint includes the step of delaying publication of a first object until a second object which is referenced by the first object is published.

However, the combination of Inoue, Broder, and Cormen emphasizes the importance of updating web pages to consistently publish by topologically sorting the graph as explained in claim 1 above. This step is also common sense and consistent with Inoue and Border's insistency on keeping the objects in consistent states. In one part that is somewhat related to the limitation of this claim, Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately and consistently linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36). It is highly recommended if not commendatory therefore to publish a second web page which is referenced by a first web page as URL link before publishing the first web page, since the user will expect that the second web page is retrievable. Otherwise, the URL is a broken link or inaccessible.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Inoue and Broder's teaching to delaying publication of a first object until a second object which is referenced by the first object is published, since it would have help the web site to provide accurate and consistent information for the user, prevent inaccessible to web page(s) which have been not created, not published or deleted.

Regarding dependent claim 13, which is dependent on claim 12, Inoue, Broder, and Cormen teach the limitations of claim 12 as explained above. Refer to the rationale relied to reject claim 12, the limitations of "wherein the first object and the second object include Web

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pages, and a reference between the first and second objects includes a hypertext link” is included. The rationale is incorporated herein.

Regarding dependent claim 14, which is dependent on claim 11, Inoue, Broder, and Cormen teach the limitations of claim 11 as explained above. Inoue does not explicitly disclose the step of satisfying at least one consistency constraint includes the step of publishing two compound objects together if the compound objects are both constructed from at least one common changed fragment.

Inoue teaches two web pages (compound objects) are constructed from at least one common page (fragment) (Inoue, fig.1, web pages 104 and web page contains “ANC5” both are constructed from at least one common web page contains “ANC4”). Further, Inoue teaches generating web pages “not to confuse a reader of an HTML document” (Inoue, col.3, lines 18-23), and updating compound objects (web pages) if a fragment (web page) which has connection relationships to the compound objects are changed (Inoue, col.17, lines 55-62; col.18, line 61 – col.19, line 24).

Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Inoue and Broder to publishing two compound objects together if the compound objects are both constructed from at least one common changed

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fragment, since the both compound objects reflect current information which has changed in a common fragment.

Regarding dependent claim 15, which is dependent on claim 1, Inoue, Broder, and Cormen teach the limitations of claim 1 as explained above. Refer to the rationale relied to reject claim 1, the limitation of “wherein at least one of the plurality of objects is a Web page” is addressed. The rationale is incorporated herein.

Claims 27-29, 32-34, 37, and 40-41 are for a computer system performing the method of claims 1-3, 6-8, 11, and 14-15, respectively and are rejected under the same rationale.

Claims 38-39 are for a computer system performing the method of claims 12-13, respectively and are rejected under the same rationale.

Regarding independent claim 53, Inoue teaches the steps of:

- providing a plurality of objects (Inoue, col.12, lines 33-38, providing many hypertext documents (objects)); and
- constructing at least one graph, the at least one graph including nodes representing objects and edges for connecting nodes having relationships (Inoue, col.12, lines 33-50; and fig.13, constructing hierarchy structure of nodes representing objects and edges for connecting nodes having relationship), at least some of the edges being

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derived from at least one consistency constraint (Inoue, col.18, line 61 – col.19, line 24).

Inoue does not explicitly disclose the step of finding at least one strongly connected component in the at least one graph.

Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Broder and Inoue to traversing the graph to update web pages and links of a web site, since it would have help the web site to provide accurate and consistent information for the user, prevent inaccessible to web page(s) which have been deleted or added.

Moreover, Cormen teaches the step of using depth first search to perform topological sort (page 485, lines 15-17 from bottom) and to find strongly connected components (page 488, section 23.5 and page 489, figure 23.9, “finding strongly connected component of a graph”). As disclosed on page 488, lines 8 to 1 from bottom, Cormen’s method is to find dependency among objects.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Inoue, and Border into Cormen to find strongly connected components since finding strongly connected components are necessary in order to update them to consistent state together to publish.

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Regarding dependent claim 54, which is dependent on claim 53, Inoue, Broder, and Cormen teach the limitations of claim 53 as explained above. The limitation of “publishing a set of objects belonging to same strongly connected component group” is rejected under the same rationale as provide in the rejection of claim 53 above.

Regarding dependent claim 55, which is dependent on claim 53, Inoue, Broder, and Cormen teach the limitations of claim 53 as explained above. The limitation of using “topologically storing at least part of the at least graph” is addressed under the same rationale as provide above in the rejection of claim 53.

Regarding dependent claim 56, which is dependent on claim 55, Inoue, Broder, and Cormen teach the limitations of claim 55 as explained above. The limitation of “examining objects in an order defined by topological sort; and when an unpublished object is examined, publishing the unpublished object together with all objects belonging to a same strongly connected component” is addressed under the same rationale a provide in the rejection of claim 55 above.

Regarding dependent claims 57-58, which is dependent on claim 53, Inoue, Broder, and Cormen teach the limitations of claim 53 as explained above. Claims 57-58 teach the limitations similar to the limitations of claims 12-13, respectively and are rejected under the same rationale incorporated herein.

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Regarding dependent claim 59, which is dependent on claim 53, Inoue, Broder and Cormen teach the limitations of claim 53 as explained above. Inoue teaches wherein an edge exists from a first object to a second object in at least one of the at least one graphs if the second object has a reference to the first object (Inoue, col.12, line 55 – col.13, line 4 and fig.10 and 13).

Regarding dependent claim 60, which is dependent on claim 53, Inoue, Broder, and Cormen teach the limitations of claim 53 as explained above. Claim 60 teach the limitations similar to the limitations of claim 14, and is rejected under the same rationale incorporated herein.

Regarding independent claim 61, claim 61 teaches the limitations are similar to claim 1 and rejected under the same rationale incorporated herein. Claim 61 also includes the limitation of publishing at least one of the plurality of objects.

Inoue does not explicitly disclose publishing at least one of plurality of objects. However, Inoue teaches “generating HTML documents used for all purpose ... not to confuse a reader of an HTML document” (Inoue, col.3, lines 18-23) which suggests HTML documents/web pages (objects) are published for readers.

Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately and consistently linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36).

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It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Broder and Inoue to publish web pages for the users after prepared as Inoue suggested.

Regarding claims 62-63, 66-67, 70-74, the limitations of claims 62-63, 66-67, 70-74 are similar to the limitations of claims 2-3, 6, 8, 11-15, and respectively are rejected under the same rationale incorporated herein.

Regarding dependent claims 64-65, which is dependent on claim 61, Inoue, Broder, and Corman teach the limitations of claim 61 as explained above. Refer to the rationale relied to reject claim 1, the limitation of “traversing at least one graph to determine the order includes the step of traversing by employing at least one topological sort on the at least one graph” and “the order is constructed from at least one topological sort” are addressed. The rationale is incorporated herein.

16. Claims 9-10, 35-36, and 68-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue in view of Broder and Corman as applied to claim 7 above, and further in view of Unger et al., US 6,230,168 B1 filed 11/1997.

Regarding dependent claim 9, which is dependent on claim 7, Inoue, Broder, and Corman teach the limitations of claim 7 as explained above. Inoue does not specifically disclose the steps of partitioning the plurality of objects into a plurality of groups; and publishing all objects belonging to a same group together.

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However, the combination of Inoue, Broder, and Cormen emphasizes the importance of updating web pages to consistently publish by topologically sorting the graph as explained in claim 1 above.

Unger teaches the step of grouping the objects together in logical collections (partitions) for objects (pages) by traversing the link tree (Unger, col.4 lines 43-64) to facilitate accesses to related objects that included in the collections (Unger, col.4 lines 24-28). Unger discloses, however that his “technique lends itself to quickly binding structured collections of material which have some logical ordering determined by the linked structure of the components themselves” (Unger, col.4 lines 61-64).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified and combined Unger’s method of partitioning with Inoue, Broder, and Cormen’s teaching to consistently publish the updated objects to the clients, since this will help publishing of related objects in a consistent manner.

Regarding dependent claim 10, which is dependent on claim 9, Inoue, Broder, Cormen, and Unger teach the limitations of claim 9 as explained above. Inoue, Cormen, and Unger do not explicitly teach the step for at least two of the plurality of groups, publishing all objects belonging to a first group before publishing any objects belonging to a second group.

However, the limitation of this claim on how the different groups are published is common sense and consistent with Inoue and Border’s insistency on keeping these objects in consistent states, and with Unger’s use of partitions for these related objects. If objects belong to

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different groups are published without order, a client will run more often into broken links in attempting to access pages that belong to different groups.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Inoue and Border's teaching and Unger to publish objects that belong to the same group first before publishing objects in other groups, to provide more efficient and consistent access to pages of the same group since consistency in servicing pages is an important factor to the client's feeling about a certain website.

Claims 35-36 are for a computer system performing the method of claims 9-10, respectively and are rejected under the same rationale.

17. Claims 16-20, 22 and 42-46, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al., US 6,336,123 B2 filed 10/1997 in view of Broder et al., US 6,073,135 filed 03/1998, and Unger et al., US 6,230,168 B1 filed 11/1997.

Regarding independent claim 16, Inoue teaches the step of:

- providing a plurality of objects, including compound objects (Inoue, col.12, lines 33-38, providing many hypertext documents (objects). Fig.13, object1 (id1) is a compound object, since object1 (id1) is constructed from fragments id2, id3, and id4).

Inoue does not explicitly disclose the steps of partitioning at least some of the plurality of objects into a plurality of groups such that if two compound objects are constructed from at least one common changed fragment, then the compound objects are placed in the same group; and publishing all objects belonging to a same group together.

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However, Inoue teaches two web pages (compound objects) are constructed from at least one common page (fragment) (Inoue, fig. 1, web pages 104 and web page contains “ANC5” both are constructed from at least one common web page contains “ANC4”). Further, Inoue teaches generating web pages “not to confuse a reader of an HTML document” (Inoue, col.3, lines 18-23), and updating compound objects (web pages) if a fragment (web page) which has connection relationships to the compound objects are changed (Inoue, col.17, lines 55-62; col.18, line 61 – col.19, line 24).

Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Broder and Inoue to traversing the graph to update web pages and links of a web site, since it would have help the web site to provide accurate and consistent information for the user, prevent inaccessible to web page(s) which have been deleted or added.

Unger teaches the step of grouping the objects together in logical collections (partitions) for objects (pages) by traversing the link tree (Unger, col.4 lines 43-64) to facilitate accesses to related objects (e.g. compound objects that are constructed from at least one common changed fragment are related objects) that included in the collections (Unger, col.4 lines 24-28).

Although Unger groups objects in a different manner, it is only because he uses a different criteria. Unger discloses, however that his “technique lends itself to quickly binding structured

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collections of material which have some logical ordering determined by the linked structure of the components themselves” (Unger, col.4 lines 61-64).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Unger’s method of partitioning with Inoue and Broder’s teaching to partitioning and publish web pages which are constructed by at least one common changed fragment, since it would have helped publishing of related objects that depend on a common fragment in a consistent manner.

Regarding dependent claim 17, which is dependent on claim 16, Inoue, Broder, and Unger teach the limitations of claim 16 as explained above. Challenger and Unger do not explicitly teach the step for at least two of the plurality of groups, publishing all objects belonging to a first group before publishing any objects belonging to a second group.

However, the limitation of this claim on how the different groups are published is common sense and consistent with Inoue and Broder’s insistency on keeping these objects in consistent states, and with Unger’s use of partitions for these related objects. If objects belong to different groups are published without order, a client will run more often into broken links in attempting to access pages that belong to different groups.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Unger to publish objects that belong to the same group first before publishing objects in other groups, to provide more efficient and consistent access to pages of the same group since consistency in servicing pages is an important factor to the client’s feeling about a certain website.

Regarding dependent claim 18, which is dependent on claim 16, Inoue, Broder, and Unger teach the limitations of claim 16 as explained above. Inoue does not explicitly disclose the step of delaying publication of a first object until a second object which is referenced by the first object is published.

However, the combination of Inoue, Broder, and Cormen emphasizes the importance of updating web pages to consistently publish by traversing the graph as explained in claim 16 above. This step is also common sense and consistent with Inoue and Border's insistency on keeping the objects in consistent states. In one part that is somewhat related to the limitation of this claim, Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately and consistently linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36). It is highly recommended if not commendatory therefore to publish a second web page which is referenced by a first web page as URL link before publishing the first web page, since the user will expect that the second web page is retrievable. Otherwise, the URL is a broken link or inaccessible.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Inoue and Broder's teaching to delaying publication of a first object until a second object which is referenced by the first object is published, since it would have help the web site to provide accurate and consistent information for the user, prevent inaccessible to web page(s) which have been not created, not published or deleted.

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Regarding dependent claim 19, which is dependent on claim 18, Inoue, Broder, and Unger teach the limitations of claim 18 as explained above. The limitation of “wherein the first object and the second object are Web pages and a reference between the first and second object is a hypertext link” is included. The rationale is incorporated herein.

Regarding dependent claim 20, which is dependent on claim 16, Inoue, Broder, and Unger teach the limitations of claim 16 as explained above. Inoue further teaches the steps of:

- representing objects by nodes on at least one graph (Inoue, col.12, lines 33-50; and fig.13); and
- representing relationships between the objects by connections between the nodes (Inoue, col.12, lines 33-50; and fig.13).

Regarding dependent claim 22, which is dependent on claim 20, Inoue, Broder, and Cormen teach the limitations of claim 20 as explained above. Inoue teaches wherein the connections include a directed edge from a first node representing a first object to a second node representing a second object, if the second object includes a reference to the first object (Inoue, fig.13).

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Claims 42-43, 46, and 48 are for a computer system performing the method of claims 16-17, 20, and 22, respectively and are rejected under the same rationale.

Claims 44-45 are for a computer system performing the method of claims 18-19 respectively and are rejected under the same rationale.

Regarding claims 68-69, the limitations of claims 68-69 are similar to the limitations of claims 9-10, and respectively are rejected under the same rationale incorporated herein.

18. Claims 21, 23-26, 47 and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue in view of Broder and Unger as applied to claims 16 and 20 above, and further in view of Cormen et al., "Introduction to Algorithms", copyright 1990, pages 477-493.

Regarding dependent claim 21, which is dependent on claim 20, Inoue, Broder, and Unger teach the limitations of claim 20 as explained above. Inoue does not explicitly disclose wherein the connections include an edge between two nodes representing compound objects if the two compound objects are constructed from at least one common changed fragment.

Inoue discloses, however, that he represents the relationships between nodes by edges in the graph. Besides Broder discloses a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately and consistently linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36).

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Cormen teaches the step of using topology sort to determine the order of updating (page 485 lines 1-7 from bottom, and figure 23.7 on page 486) to include an edge between two nodes representing compound objects if the two compound objects are constructed from at least one common changed fragment. Following his example, one skill in the art can easily determine how two objects embed a common changed fragment. Considering the undershorts a fragment, shoes a first object and pants a second object, one skill in the art would have seen that pants and shoes both depend on undershorts. Pants and shoes are in this case constructed from the common fragment undershorts, as explained by Cormen.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Cormen and combined his teaching into Inoue and Broder to include an edge between two nodes representing compound objects if the two compound objects are constructed from at least one common changed fragment, since it would have helped traversing the graph to update relating objects in a consistent manner.

Regarding dependent claim 23, which is dependent on claim 20, Inoue, Broder and Unger teach the limitations of claim 20 as explained above. Inoue does not disclose the steps of:

- determining if a first compound object and a second compound object embed at least one common changed fragment by:
 - topologically sorting at least part of a graph including dependence edges between objects;
 - examining the graph in an order defined by the topological sort; and

- constructing a union between a set including a second object and a set including changed fragments needed to construct the second object for at least one edge which begins with the second object and terminates in the first object and for which the second object has changed.

However, Inoue teaches two web pages (compound objects) are constructed from at least one common page (fragment) (Inoue, fig. 1, web pages 104 and web page contains “ANC5” both are constructed from at least one common web page contains “ANC4”). Further, Inoue teaches generating web pages “not to confuse a reader of an HTML document” (Inoue, col.3, lines 18-23), and updating compound objects (web pages) if a fragment (web page) which has connection relationships to the compound objects are changed (Inoue, col.17, lines 55-62; col.18, line 61 – col.19, line 24).

Broder teaches a graph represents connectivity of web pages of a web site is constructed, traversed, and sorted to maintain accurately linkage information so that a user is able to access web pages or links within the web pages (Broder, col.1, lines 61-66; col.2, lines 9-12; col.3, lines 15-22, lines 34-42; col.5, lines 30-36).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Broder and Inoue to determine web pages (compound objects) need to updated when at least one common fragment has changed, since it would have helped maintaining accurate and consistent information for the user, prevent inaccessible to web page(s) which have been changed, deleted or added.

However, the combination of Inoue and Broder does not explicitly disclose the use of topology sort to traversing the graph for updating web pages.

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Cormen teaches the step of using topology sort to determine the order of updating (page 485 lines 1-7 from bottom, and figure 23.7 on page 486). Following his example, one skill in the art can easily determine how two objects embed a common changed fragment. Consider Cormen's undershorts the fragment, shoes the first object and pants the second object, one skill in the art would have seen that pants and shoes both depend on undershorts. If undershorts changes, pants and shoes have to change, as explained by Cormen.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Cormen and combined his teaching into Inoue and Broder to determine if a first compound object and a second compound object embed at least one common changed fragment since this step is necessary in updating the two compound objects once a common fragment is changed.

Regarding dependent claim 24, which is dependent on claim 20, Inoue, Broder, and Unger teach the limitations of claim 20 as explained above. Inoue does not explicitly disclose the step of performing a topological sort on at least part of the at least one graph for finding strongly connected components.

Cormen teaches the step of using depth first search to perform topological sort (page 485, lines 15-17 from bottom) and to find strongly connected components (page 488, section 23.5 and page 489, figure 23.9, "finding strongly connected component of a graph"). As disclosed on page 488, lines 8 to 1 from bottom, Cormen's method is to find dependency among objects.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Cormen into Inoue, Broder and Unger to find strongly

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connected components since finding strongly connected components are necessary in order to update them to consistent state together to publish.

Regarding dependent claim 25, which is dependent on claim 24, Inoue, Broder, Unger, and Cormen teach the limitations of claim 24 as explained above. Refer to the rationale relied to reject claim 24, the limitation of “publishing a set of object belonging to a same strongly connected component, of at least one graph, together” is also addressed.

Regarding dependent claim 26, which is dependent on claim 24, Inoue, Broder, Unger, and Cormen teach the limitations of claim 24 as explained above. The limitation of “examining objects in an order defined by topological sort; and when an unpublished object is examined, publishing the unpublished object together with all objects belonging to a same strongly connected component” is obvious under the same rationale a provide in the rejection of claims 23, 24 and 25 incorporated herein.

Claims 47 and 49-52 are for a computer system performing the method of claims 21 and 23-26 respectively and are rejected under the same rationale.

Response to Arguments

19. Applicant's arguments filed on 01/06/2003 have been fully considered have been considered but are moot in view of the new ground(s) of rejection.

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Applicants argue with respect to newly added claims 61-74, the prior art does not disclose that the feature of “publishing at least one of plurality of objects” as recited in claim 61.

However, the combination of Inoue, Broder, and Cormen teaches this limitation as explained in the rejection of claim 61 above.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Shoham, US 5855015, filed 05/1995, teaches system and method for retrieval of hyperlinked information resources.

Chi et al., US 6509898 B2, filed 04/1998, teaches usage based method of traversing and displaying generalized graph structure.

Fogg et al., US 6321242 B1, filed 02/1998, teaches re-linking technology for a moving web site.

Nielsen, US 6021435, filed 03/1996, teaches apparatus and method for displaying enhanced hypertext link anchor information regarding hypertext page availability and context.

Tenev et al., US 6108698, filed 07/1998, teaches nod-link data defining graph and a tree within the graph.

Mangat et al., US 6049799, filed 05/1997, teaches document link management using directory services.

Yoshioka et al., US 5553216, filed 02/1994, teaches structure database system together with structure definition frame storing document body data.


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21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu v Huynh whose telephone number is (703) 305-9774. The examiner can normally be reached on Monday through Friday, except the second Friday of each bi-week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather R Herndon can be reached on (703) 308-5186. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications (703) 746-7238 for After Final communications, and (703) 746-7240 for Non-Official/Draft.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9000.

TVH
March 23, 2003


STEPHEN S. HONG
PRIMARY EXAMINER